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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/807,075	04/09/2001	Kunio Nishimura	Q53366	2214

7590 08/09/2004
Sughrue Mion Zinn
Macpeak & Seas
2100 Pennsylvania Avenue NW
Washington, DC 20037-3213

EXAMINER

LISH, PETER J

ART UNIT	PAPER NUMBER
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1754

DATE MAILED: 08/09/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/807,075

Applicant(s)

NISHIMURA ET AL.

Examiner

Peter J Lish

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 25 May 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-9, 22-25 and 28-39 is/are pending in the application.
- 4a) Of the above claim(s) 34-38 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-9, 22-25, 28-33 and 39 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☒ Interview Summary (PTO-413)
Paper No(s)/Mail Date: 4/29/04
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Election/Restrictions

Applicant's election without traverse of Group I, claim(s) 1-9, 14-17, 22-25, and 28-33, in the reply filed on 5/25/04 is acknowledged.

Response to Arguments

Applicant's arguments filed 5/25/04 have been fully considered but they are not persuasive. Applicants argue that the rejection over Hase et al. is improper because there is neither a showing of inherency nor a suggestion to modify. The examiner notes that a proper 102/103 rejection does not rely on such. Rather, a 102/103 rejection is proper when the reference discloses all the limitations of a claim except a property or function, and the examiner cannot determine whether or not the reference inherently possesses properties which anticipate or render obvious the claimed invention but has basis for shifting the burden of proof to applicant as in *In re Fitzgerald*, 619 F.2d 67, 205 USPQ 594 (CCPA 1980). See MPEP § 2112- 2112.02. Additionally, it is noted that a specific example showing a powder with at most 1 wt% of particles having sizes of less than or equal to 3 microns is not required for such a rejection to be proper.

In response to applicant's arguments regarding the newly amended limitation with respect to the Co value of the graphite, applicant's arguments have been considered but are moot in view of the new ground(s) of rejection.

Claim Rejections - 35 USC § 103

Claims 1-9 and 30-33 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hase et al. (US 5,910,383) in view of Greinke et al. (US 5,677,082).

Hase et al. teach a graphite powder, for use in a lithium battery negative electrode, with a specific surface area of $.85 \text{ m}^2/\text{g}$, an aspect ratio of not greater than 2, an average particle size of 16 micrometers, with no particles of 48 micrometers or greater and less than 3 wt% of particles 2 micrometers and smaller.

It is not explicitly taught that the particle mixture of Hase et al. contain 1 wt. % or less of particles having a particle size of 3 microns or less. However, it is expected that this may be the case given that the reference teaches, in example 1, a particle mixture having less than 3 wt % of particles having a particle size of 2 microns or less. Where, as here, the claimed and prior art products are identical or substantially identical, or are produced by identical or substantially identical processes, the burden of proof is shifted to the applicant to prove that the prior art products do not necessarily or inherently possess the characteristics of his claimed product. See *In re Best*, 195 USPQ 430. Alternatively, a particle mixture having 1 wt % or less of particles having a particle size of 3 microns or less is anticipated because the range claimed by the applicant and the range taught by the reference are overlapping, see *In re Malagari*, 182 USPQ 549.

Hase et al. does not explicitly teach the production of graphite particles having a lattice spacing, or Co value, of less than 6.720 Angstroms. However, Hase et al. does teach that the graphitization of the particles may be carried out by any known means at temperatures as high as 3000 °C. It is known in the art, and specifically taught by Greinke et al., that the electrochemical capacity of a lithium battery electrode is improved by increasing the x-ray density of individual

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carbon particles, or in other words, by decreasing the lattice spacing Co value. The means of doing so is to use well-graphitizing materials (such as mesophase pitch particles) and to perform the graphitization process so as to achieve the fullest graphitization. It therefore would have been obvious to one of ordinary skill at the time of invention to perform a full graphitization on the particles of Hase et al. (such as an extended heating at 3000 °C), in order to improve the electrochemical capacity of the resulting battery. It is expected that in doing so, a lattice spacing of less than 6.720 Angstroms be achieved.

While its density, oxidation initiation temperature, and electrical resistance are not specifically stated, it is expected that the graphite powder of Hase et al. inherently possesses these properties within the claimed limitations for reasons as follows.

Control of the density of graphite particles is admitted to depend upon the control of aspect ratio, average particle size, and particle size distribution (page 27 of disclosure). Because these properties of the reference graphite powder are within the claimed ranges, the density is expected to yield a value within the claimed range.

Control of oxidation initiation temperature of graphite particles is admitted to depend upon chemical activity (reduced by using easily graphitizable carbon materials, or mesophase carbon), aspect ratio, and the specific surface area. Because these properties of the reference graphite powder are within the claimed ranges, and is made from mesophase carbon, the oxidation initiation temperature is expected to yield a value within the claimed range.

Furthermore, because the graphite powder of Hase et al. is identical in its properties to the graphite powder of the invention, it is expected that its behavior under compression will be identical. Therefore, it is expected that when the referenced powder is subject to pressure to give

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the powder a bulk density of 1.5 g/cm^3 , the specific electrical resistance of the powder along a direction perpendicular to the direction of the pressure is not more than .06 ohm-cm.

Claims 1-9, 22-25, 30-33, and 39 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hase et al. (US 5,910,383) in view of Tamaki et al. (US 5,698,341).

Hase et al. teach a graphite powder, for use in a lithium battery negative electrode, with a specific surface area of $.85 \text{ m}^2/\text{g}$, an aspect ratio of not greater than 2, an average particle size of 16 micrometers, with no particles of 48 micrometers or greater and less than 3 wt% of particles 2 micrometers and smaller.

It is not explicitly taught that the particle mixture of Hase et al. contain 1 wt. % or less of particles having a particle size of 3 microns or less. However, it is expected that this may be the case given that the reference teaches, in example 1, a particle mixture having less than 3 wt % of particles having a particle size of 2 microns or less. Where, as here, the claimed and prior art products are identical or substantially identical, or are produced by identical or substantially identical processes, the burden of proof is shifted to the applicant to prove that the prior art products do not necessarily or inherently possess the characteristics of his claimed product. See *In re Best*, 195 USPQ 430. Alternatively, a particle mixture having 1 wt % or less of particles having a particle size of 3 microns or less is anticipated because the range claimed by the applicant and the range taught by the reference are overlapping, see *In re Malagari*, 182 USPQ 549.

Hase et al. does not explicitly teach the production of graphite particles having a lattice spacing, or Co value, of less than 6.720 Angstroms. However, Hase et al. does teach that the

graphitization of the particles may be carried out by any known means at temperatures as high as 3000 °C.

Tamaki et al. teaches the production of a graphite material for use in a lithium secondary battery. Tamaki et al. teaches the formation of milled mesophase fibers and mesophase microbeads and the subsequent advantages achieved by performing graphitization in the presence of a boron compound. The major advantage is that the resulting graphite has a lower lattice spacing, or d_{002} , value. The low lattice spacing facilitates lithium incorporation and departure from the graphite material, thereby the battery exhibits scarce deterioration of the charge and discharge capacities and charge and discharge efficiencies. The lattice spacing achieved by such as method is typically less than 6.720 Angstroms, and often less than 6.717 Angstroms (see examples). It would have been obvious to one of ordinary skill at the time of invention to perform the graphitization of Tamaki et al. on the mesophase particles of Hase et al., in order to achieve the low lattice spacing d_{002} value and the advantages that accompany it.

While its density, oxidation initiation temperature, and electrical resistance are not specifically stated, it is expected that the graphite powder of Hase et al. in view of Tamaki et al. inherently possesses these properties within the claimed limitations for reasons as follows.

Control of the density of graphite particles is admitted to depend upon the control of aspect ratio, average particle size, and particle size distribution (page 27 of disclosure). Because these properties of the reference graphite powder are within the claimed ranges, the density is expected to yield a value within the claimed range.

Control of oxidation initiation temperature of graphite particles is admitted to depend upon chemical activity (reduced by using easily graphitizable carbon materials, or mesophase

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carbon), aspect ratio, and the specific surface area. Because these properties of the reference graphite powder are within the claimed ranges, and is made from mesophase carbon, the oxidation initiation temperature is expected to yield a value within the claimed range.

Furthermore, because the graphite powder of Hase et al. in view of Tamaki et al. is identical in its properties to the graphite powder of the invention, it is expected that its behavior under compression will be identical. Therefore, it is expected that when the referenced powder is subject to pressure to give the powder a bulk density of 1.5 g/cm^3 , the specific electrical resistance of the powder along a direction perpendicular to the direction of the pressure is not more than .06 ohm-cm.

Claims 1-9, 22-25, 30-33, and 39 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tamaki et al. (US 5,698,341) taken with Hase et al. (US 5,910,383).

Tamaki et al. teaches the production of a graphite material for use in a lithium secondary battery. Tamaki et al. teaches the formation of milled mesophase fibers and mesophase microbeads and the subsequent advantages achieved by performing graphitization in the presence of a boron compound. The major advantage is that the resulting graphite has a lower lattice spacing, or d_{002} value. The low lattice spacing facilitates lithium incorporation and departure from the graphite material, thereby the battery exhibits scarce deterioration of the charge and discharge capacities and charge and discharge efficiencies. The lattice spacing achieved by such as method is typically less than 6.720 Angstroms, and often less than 6.717 Angstroms (see examples). Tamaki additionally teaches that the average particle size of the

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milled mesophase fibers or mesophase microbeads be between 8 and 50 microns, preferably between 10 and 30 microns.

Tamaki et al. does not explicitly teach the specific surface area, the aspect ratio, the oxidation initiation temperature, the tapping bulk density, or the electrical resistance of the resulting graphite particles.

Hase et al. teach a graphite powder, for use in a lithium battery negative electrode, which is produced from mesophase particles, or microbeads. The particles have a specific surface area of .85 m²/g, an aspect ratio of not greater than 2, an average particle size of 16 micrometers, and no particles of 48 micrometers or greater and less than 3 wt% of particles 2 micrometers and smaller. It would have been obvious to one of ordinary skill at the time of invention to use the mesophase particles of Hase et al. in the process of Tamaki et al., because they meet the requirements of Tamaki et al. concerning mesophase particles and are intended for use in lithium secondary battery electrodes.

It is not explicitly taught that the particle mixture of Hase et al. contain 1 wt. % or less of particles having a particle size of 3 microns or less. However, it is expected that this may be the case given that the reference teaches, in example 1, a particle mixture having less than 3 wt % of particles having a particle size of 2 microns or less. Where, as here, the claimed and prior art products are identical or substantially identical, or are produced by identical or substantially identical processes, the burden of proof is shifted to the applicant to prove that the prior art products do not necessarily or inherently possess the characteristics of his claimed product. See *In re Best*, 195 USPQ 430. Alternatively, a particle mixture having 1 wt % or less of particles having a particle size of 3 microns or less is anticipated because the range claimed by the

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applicant and the range taught by the reference are overlapping, see *In re Malagari*, 182 USPQ 549.

While its density, oxidation initiation temperature, and electrical resistance are not specifically stated, it is expected that the graphite powder of Tamaki et al. taken with Hase et al. inherently possesses these properties within the claimed limitations for reasons as follows.

Control of the density of graphite particles is admitted to depend upon the control of aspect ratio, average particle size, and particle size distribution (page 27 of disclosure). Because these properties of the reference graphite powder are within the claimed ranges, the density is expected to yield a value within the claimed range.

Control of oxidation initiation temperature of graphite particles is admitted to depend upon chemical activity (reduced by using easily graphitizable carbon materials, or mesophase carbon), aspect ratio, and the specific surface area. Because these properties of the reference graphite powder are within the claimed ranges, and is made from mesophase carbon, the oxidation initiation temperature is expected to yield a value within the claimed range.

Furthermore, because the graphite powder of Tamaki et al. taken with Hase et al. is identical in its properties to the graphite powder of the invention, it is expected that its behavior under compression will be identical. Therefore, it is expected that when the referenced powder is subject to pressure to give the powder a bulk density of 1.5 g/cm^3 , the specific electrical resistance of the powder along a direction perpendicular to the direction of the pressure is not more than .06 ohm-cm.

Claims 1-9 and 30-33 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hase et al. in view of Greinke et al. (US 5,677,082) and further in view of Ozaki et al. (US 5,344,724).

Hase et al. teach a graphite powder, for use in a lithium battery negative electrode, with a specific surface area of $.85 \text{ m}^2/\text{g}$, an aspect ratio of not greater than 2, and an average particle size of preferably between 5 and 30 microns.

Hase et al. does not explicitly teach the production of graphite particles having a lattice spacing, or C_{002} value, of less than 6.720 Angstroms. However, Hase et al. does teach that the graphitization of the particles may be carried out by any known means at temperatures as high as 3000 °C. It is known in the art, and specifically taught by Greinke et al., that the electrochemical capacity of a lithium battery electrode is improved by increasing the x-ray density of individual carbon particles, or in other words, by decreasing the lattice spacing C_{002} value. The means of doing so is to use well-graphitizing materials (such as mesophase pitch particles) and to perform the graphitization process so as to achieve the fullest graphitization. It therefore would have been obvious to one of ordinary skill at the time of invention to perform a full graphitization on the particles of Hase et al. (such as an extended heating at 3000 °C), in order to improve the electrochemical capacity of the resulting battery. It is expected that in doing so, a lattice spacing of less than 6.720 Angstroms be achieved.

It is not explicitly taught that the powder of Hase et al. contain 1 wt. % or less of particles having a particle size of 3 microns or less. Ozaki et al. also teach a graphite powder for use in a lithium battery negative electrode. Ozaki teaches that particles having a size of less than 3 micron are undesirable, as they may cause intrusion into the pores of the microporous separator

in contact with the negative electrode, whereby partial short circuits may be formed within the cell, and the density of the coating with the particles may be reduced owing to a decrease in the bulk density of the particles. It therefore would have been obvious to one of ordinary skill at the time of invention to remove the particles having a particle size of 3 microns or less from the powder of Hase et al. in order to avoid the deficiencies taught by Ozaki et al.

While its density, oxidation initiation temperature, and electrical resistance are not specifically stated, it is expected that the graphite powder of Hase et al. in view of Ozaki et al. inherently possesses these properties within the claimed limitations for reasons as follows.

Control of the density of graphite particles is admitted to depend upon the control of aspect ratio, average particle size, and particle size distribution (page 27 of disclosure). Because these properties of the reference graphite powder are within the claimed ranges, the density is expected to yield a value within the claimed range.

Control of oxidation initiation temperature of graphite particles is admitted to depend upon chemical activity (reduced by using easily graphitizable carbon materials, or mesophase carbon), aspect ratio, and the specific surface area. Because these properties of the reference graphite powder are within the claimed ranges, and is made from mesophase carbon, the oxidation initiation temperature is expected to yield a value within the claimed range.

Furthermore, because the graphite powder of Hase et al. in view of Ozaki et al. is identical in its properties to the graphite powder of the invention, it is expected that its behavior under compression will be identical. Therefore, it is expected that when the referenced powder is subject to pressure to give the powder a bulk density of 1.5 g/cm^3 , the specific electrical

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resistance of the powder along a direction perpendicular to the direction of the pressure is not more than .06 ohm-cm.

Claims 1-9, 22-25, 30-33, and 39 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hase et al. in view of Tamaki et al. (US 5,698,341) and further in view of Ozaki et al. (US 5,344,724).

Hase et al. teach a graphite powder, for use in a lithium battery negative electrode, with a specific surface area of .85 m²/g, an aspect ratio of not greater than 2, and an average particle size of preferably between 5 and 30 microns.

Hase et al. does not explicitly teach the production of graphite particles having a lattice spacing, or Co value, of less than 6.720 Angstroms. However, Hase et al. does teach that the graphitization of the particles may be carried out by any known means at temperatures as high as 3000 °C.

Tamaki et al. teaches the production of a graphite material for use in a lithium secondary battery. Tamaki et al. teaches the formation of milled mesophase fibers and mesophase microbeads and the subsequent advantages achieved by performing graphitization in the presence of a boron compound. The major advantage is that the resulting graphite has a lower lattice spacing, or Co, value. The low lattice spacing facilitates lithium incorporation and departure from the graphite material, thereby the battery exhibits scarce deterioration of the charge and discharge capacities and charge and discharge efficiencies. The lattice spacing achieved by such as method is typically less than 6.720 Angstroms, and often less than 6.717 Angstroms (see examples). It would have been obvious to one of ordinary skill at the time of

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invention to perform the graphitization of Tamaki et al. on the mesophase particles of Hase et al., in order to achieve the low lattice spacing Co value and the advantages that accompany it.

It is not explicitly taught that the powder of Hase et al. in view of Tamaki et al. contain 1 wt. % or less of particles having a particle size of 3 microns or less. Ozaki et al. also teach a graphite powder for use in a lithium battery negative electrode. Ozaki teaches that particles having a size of less than 3 micron are undesirable, as they may cause intrusion into the pores of the microporous separator in contact with the negative electrode, whereby partial short circuits may be formed within the cell, and the density of the coating with the particles may be reduced owing to a decrease in the bulk density of the particles. It therefore would have been obvious to one of ordinary skill at the time of invention to remove the particles having a particle size of 3 microns or less from the powder of Hase et al. in order to avoid the deficiencies taught by Ozaki et al.

While its density, oxidation initiation temperature, and electrical resistance are not specifically stated, it is expected that the graphite powder of Hase et al. in view of Tamaki et al. and further in view of Ozaki et al. inherently possesses these properties within the claimed limitations for reasons as follows.

Control of the density of graphite particles is admitted to depend upon the control of aspect ratio, average particle size, and particle size distribution (page 27 of disclosure). Because these properties of the reference graphite powder are within the claimed ranges, the density is expected to yield a value within the claimed range.

Control of oxidation initiation temperature of graphite particles is admitted to depend upon chemical activity (reduced by using easily graphitizable carbon materials, or mesophase

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carbon), aspect ratio, and the specific surface area. Because these properties of the reference graphite powder are within the claimed ranges, and is made from mesophase carbon, the oxidation initiation temperature is expected to yield a value within the claimed range.

Furthermore, because the graphite powder of Hase et al. in view of Tamaki et al. and further in view of Ozaki et al. is identical in its properties to the graphite powder of the invention, it is expected that its behavior under compression will be identical. Therefore, it is expected that when the referenced powder is subject to pressure to give the powder a bulk density of 1.5 g/cm^3 , the specific electrical resistance of the powder along a direction perpendicular to the direction of the pressure is not more than .06 ohm-cm.

Claims 1-9, 22-25, 30-33, and 39 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tamaki et al. (US 5,698,341) taken with Hase et al. (US 5,910,383) and further in view of Ozaki et al. (US 5,344,724).

Tamaki et al. teaches the production of a graphite material for use in a lithium secondary battery. Tamaki et al. teaches the formation of milled mesophase fibers and mesophase microbeads and the subsequent advantages achieved by performing graphitization in the presence of a boron compound. The major advantage is that the resulting graphite has a lower lattice spacing, or d_{002} value. The low lattice spacing facilitates lithium incorporation and departure from the graphite material, thereby the battery exhibits scarce deterioration of the charge and discharge capacities and charge and discharge efficiencies. The lattice spacing achieved by such as method is typically less than 6.720 Angstroms, and often less than 6.717 Angstroms (see examples). Tamaki additionally teaches that the average particle size of the

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milled mesophase fibers or mesophase microbeads be between 8 and 50 microns, preferably between 10 and 30 microns.

Tamaki et al. does not explicitly teach the specific surface area, the aspect ratio, the oxidation initiation temperature, the tapping bulk density, or the electrical resistance of the resulting graphite particles.

Hase et al. teach a graphite powder, for use in a lithium battery negative electrode, with a specific surface area of $.85 \text{ m}^2/\text{g}$, an aspect ratio of not greater than 2, and an average particle size of preferably between 5 and 30 microns. It would have been obvious to one of ordinary skill at the time of invention to use the mesophase particles of Hase et al. in the process of Tamaki et al., because they meet the requirements of Tamaki et al. concerning mesophase particles and are intended for use in lithium secondary battery electrodes.

It is not explicitly taught that the powder of Tamaki et al. taken with Hase et al. contain 1 wt. % or less of particles having a particle size of 3 microns or less. Ozaki et al. also teach a graphite powder for use in a lithium battery negative electrode. Ozaki teaches that particles having a size of less than 3 micron are undesirable, as they may cause intrusion into the pores of the microporous separator in contact with the negative electrode, whereby partial short circuits may be formed within the cell, and the density of the coating with the particles may be reduced owing to a decrease in the bulk density of the particles. It therefore would have been obvious to one of ordinary skill at the time of invention to remove the particles having a particle size of 3 microns or less from the powder of Tamaki et al. taken with Hase et al. in order to avoid the deficiencies taught by Ozaki et al.

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While its density, oxidation initiation temperature, and electrical resistance are not specifically stated, it is expected that the graphite powder of Tamaki et al. taken with Hase et al. and further in view of Ozaki et al. inherently possesses these properties within the claimed limitations for reasons as follows.

Control of the density of graphite particles is admitted to depend upon the control of aspect ratio, average particle size, and particle size distribution (page 27 of disclosure). Because these properties of the reference graphite powder are within the claimed ranges, the density is expected to yield a value within the claimed range.

Control of oxidation initiation temperature of graphite particles is admitted to depend upon chemical activity (reduced by using easily graphitizable carbon materials, or mesophase carbon), aspect ratio, and the specific surface area. Because these properties of the reference graphite powder are within the claimed ranges, and is made from mesophase carbon, the oxidation initiation temperature is expected to yield a value within the claimed range.

Furthermore, because the graphite powder of Tamaki et al. taken with Hase et al. and further in view of Ozaki et al. is identical in its properties to the graphite powder of the invention, it is expected that its behavior under compression will be identical. Therefore, it is expected that when the referenced powder is subject to pressure to give the powder a bulk density of 1.5 g/cm^3 , the specific electrical resistance of the powder along a direction perpendicular to the direction of the pressure is not more than .06 ohm-cm.

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Claims 28-29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hase et al. in view of Greinke et al. alone, or further in view of Ozaki et al., as applied above and further in view of Yoneda et al. (USPN 5,591,547).

Hase et al. teach that for use in the layers of active materials, a binder can be chosen, as desired. Examples include: polyvinyl resins, fluorine-containing resins, etc. (column 6, lines 36-42). Yoneda et al. teach polyvinylidene fluoride as a specific binding material for use with graphite particles in a lithium battery electrode (column 5, lines 1-20). It would have been obvious to one of ordinary skill at the time of invention to use polyvinylidene fluoride as the binder for the graphite particles of Hase et al.

Claims 28-29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hase et al. in view of Tamaki et al. alone, or further in view of Ozaki et al., as applied above and further in view of Yoneda et al. (USPN 5,591,547).

Hase et al. teach that for use in the layers of active materials, a binder can be chosen, as desired. Examples include: polyvinyl resins, fluorine-containing resins, etc. (column 6, lines 36-42). Yoneda et al. teach polyvinylidene fluoride as a specific binding material for use with graphite particles in a lithium battery electrode (column 5, lines 1-20). It would have been obvious to one of ordinary skill at the time of invention to use polyvinylidene fluoride as the binder for the graphite particles of Hase et al.

Claims 28-29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tamaki et al. taken with Hase et al. alone, or further in view of Ozaki et al., as applied above and further in view of Yoneda et al. (USPN 5,591,547).

Hase et al. teach that for use in the layers of active materials, a binder can be chosen, as desired. Examples include: polyvinyl resins, fluorine-containing resins, etc. (column 6, lines 36-42). Yoneda et al. teach polyvinylidene fluoride as a specific binding material for use with graphite particles in a lithium battery electrode (column 5, lines 1-20). It would have been obvious to one of ordinary skill at the time of invention to use polyvinylidene fluoride as the binder for the graphite particles of Hase et al.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Peter J Lish whose telephone number is 571-272-1354. The examiner can normally be reached on 9:00-6:00 Monday through Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stanley Silverman can be reached on 571-272-1358. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

PL



STUART L. HENDRICKSON
PRIMARY EXAMINER